

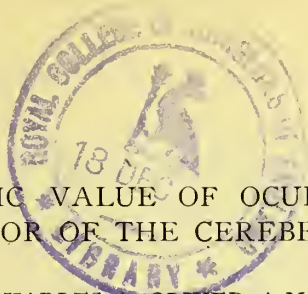
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The Diagnostic Value of Ocular Changes
in Tumor of the Cerebellum.

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THE DIAGNOSTIC VALUE OF OCULAR CHANGES IN TUMOR OF THE CEREBELLUM.

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This case, with its characteristic general symptomatology and its post-mortem proving, is interesting from its ophthalmic standpoint alone; and for this reason has been given in its every detail as illustrative of the value of a thorough study of the eye-symptoms in all cases of suspected cerebellar growth.

The two optic nerves losing their conduction properties, gave rise to blindness. To these losses of sensory action, due to lymph stasis with consequent pressure-symptoms, as was shown at the post-mortem examination, by the blocking of the ventricular spaces and the undue tentorial tension, must be added the symptomatic want of light reflex with the preservation of the iris responses during associated muscular contracture—symptoms which, taken together, are highly designative of many of the cases of neoplasms situated in the cerebellar region.

The peculiar form of the ophthalmoscopic picture of neuro-retinal change is also highly characteristic of growth in this position. Not very pronounced, though dense, compact and squeezed dry, as it were, the nerve-head swelling often becomes representative of the disorder; far different from the purplish succulent types that are so frequently found with the cerebral form of lesion.

These two series of motor and sensory changes in the visual apparatus seen in all manner of relative degrees and intensities, are here offered from an ophthalmic standpoint, as an additional grouping of specialized symptoms that in themselves alone may be oftentimes considered of sufficient diagnostic import to give a solution to the not infrequent problem of the presence of cerebellar neoplasm.

The general history of the case in full is as follows:¹ In February, 1898, I was asked by Dr. James Hendrie Lloyd to see a case of supposed cerebellar tumor in the nervous wards of the hospital.

¹ For the original of these most carefully taken notes I am under obligation to my friend and former resident physician at the hospital, Dr. T. Percival Gerson, of Lansdowne, Pa.

The patient, F. E., an only child, was born in Philadelphia in March, 1877. The labor was prolonged and difficult, but no instruments were used.

At ten months of age the patient was breastfed by a wet-nurse, when almost immediately afterwards, in accordance with his mother's statement, small pustules appeared over the entire body. Five months later he had "spasms" that were supposed to be dependent upon dentition.

As a child, he had no other diseases but slight attacks of rubeola and pertussis.

In 1893, he was admitted to one of the State schoolships, upon which he made one cruise of six months' duration, being probably discharged for insubordination. Half a year after his return he contracted a gonorrhœal urethritis, which was treated at one of the large hospitals in this city. He was never known to masturbate. About this time he began to make free use of various alcoholic liquors. For a number of years he was lazy, kept late hours, and lived among evil associations.

There was never any history of traumatism. In August, 1897, he began to complain of frontal and occipital headaches, and more or less constantly held his head between his hands in the attitude of leaning over. Attacks of melancholia appeared. His eyes became expressionless and his hearing was impaired.

Four months later, it was noticed that his sight was gradually failing and that his hearing had grown worse.

Smell and taste never seemed to be affected. There was never any paresis or paralysis.

Appetite continued good until two weeks preceding his admission into the hospital. Before his present illness he was considered as always doing well in his school work. In November, 1897, it was noticed that he walked with his head hanging forward on his breast and that his eyes were kept rotated upwardly. He was unable—most probably in part due to his impaired hearing—to answer questions. He did not exhibit any illusions or delusions. He was never known to have any attacks of vertigo or exhibit any convulsive seizures.

Since January, 1898, he seemed to have developed an apathy for talking, although occasionally he would blurt out some of his wants. His mother stated that he had been sleeping a great deal, both by day and by night.

His father, who was an alcoholic, died of an injury. His mother was living and well. There was not any history of mental disorder or tuberculosis.

Careful physical examination, made on February 25th, showed the following conditions. Decubitus was on one side with the knees flexed and the thighs drawn up against the abdomen. The head was bent forward and the hands were clasped behind the neck. The skin of the abdomen was dry and harsh, with a few scattered, depressed, whitish scars. The body was spare and the legs and arms were somewhat wasted. The patient was more or less restless at times, but usually rested quietly. He would not respond when spoken to, seeming not to hear, even when the voice was forcibly transmitted directly into the ear; although he would often plaintively cry out for something, as "I want a cigarette," or give vent to the most passionate impulse, as "Fell him with a belaying-pin, mate!"

His hair was disheveled and sandy in tint. At times, while either lying quietly or complaining that his head ached most intensely, he would move his hand through his hair, clasping either the forehead or the occiput. There were no marks of cuts or wounds on the scalp.

The chest expansion was quite symmetrical. The right border of the sternum at the junctures of the costal cartilages was both prominent and knobbed. The

right lower chest anteriorly over the lower ribs was somewhat more hollow than the corresponding area upon the opposite side. The intercostal spaces could be readily palpated, while the supra-sternal notch and the supra-clavicular and infra-clavicular fossa were not difficult to see. The costal angle was about eighty degrees. The skin of the chest, like that of the abdomen, was dry and harsh, though the superficial veins were not unduly prominent.

Pneumonic palpation was uncertain, as the patient could not be made to speak. Percussion revealed a probable more resonance on the left side anteriorly than elsewhere. Posteriorly, upon the right side, there seemed to be an area of flatness which was continuous with that of the normal liver and extended beyond it. A similar area of flatness was found deeply situated in the corresponding axillary region.

Auscultation showed that the breathing sounds were seemingly normal anteriorly. Laterally, on the right side and above the liver posteriorly, an area of almost absolute negation of the breath-sounds was obtainable. No râles could be distinguished.

Liver dullness extended from the sixth intercostal space to one-half an inch above the costal margin in the mid-clavicular line; while in the mid-axillary line it was continuous from the sixth to the tenth ribs.

No splenic dullness could be gotten.

The apex-beat of the heart was neither visible nor palpable. The sounds in the aortic region were quite pronounced, but no murmur could be detected. The sounds in the mitral region, which were more difficult to determine, gave evidence of an appreciable murmur.

The abdomen was somewhat scaphoid in shape with undue prominence of the processes. No points of tenderness could be elicited. Examination of the penis and scrotum showed the presence of a number of white blotches on the skin of the prepuce that contrasted quite markedly with the surrounding darker skin of the parts.

On the right hip, near the acetabulum, there was an abraded surface resembling a glazed-over bed sore, which was almost as large as a silver quarter of a dollar. Sensations to pin-pricks seemed at times to be delayed as long as four or five seconds. There was no demonstrable palsy in any part of the body, the patient moving his arms and limbs at will. The plantar reflex was slightly sluggish. The patellar tendon reflexes were almost absent. No patellar-clonus or toe-jerk could be obtained. Left ankle-clonus was lost.

Sensation about the head and face was much more acute than it was in the extremities. The mid-dorsal surface of the tongue was coated with a yellowish-white fur. The breath was foul.

The patient was apparently able to move his eyelids at will, but he did not wince when an object was rapidly moved before the eyes. He had a spasmodic cough, particularly during ingestion of food, he not having thorough control over deglutition. He drank all of the milk that was given to him, but he ate very little food that required mastication.

In attempting to get the patient out of bed, he was found to be too weak to even stand alone, there being a decided tendency to pitch both forward and laterally. During the night he had fallen out of bed, but did not suffer any injurious consequences. He had incontinence of both urine and feces, though the bowels were somewhat constipated.

On February 24th (the day before examination), I made my first ophthalmic study.

The pupil of the right eye was dilated *ad maximum*. The iris was irresponsive to light stimulus, though the pupil varied considerably in size and in direct accordance with what it should, during the different conjoined movements of the two eyeballs.

The media of the eye were clear. There was a rather marked choking of the optic disc, with a pronounced haze and œdema of the circumjacent retina, though the prominence of the nerve-head was not very great.

The swelling of the nerve-head was dense and compact, and the swollen tissue did not seem to possess any degree of capillarity. The retinal arteries were reduced to threads, and the corresponding veins were unduly small. There were not any signs of recent or old hemorrhagic extravasations. There was a low degree of farsightedness with a minor amount of astigmatism.

The pupil of the left eye was the same size as that of the right eye. The iris behaved similarly with that of its fellow.

The media of the eye were transparent. The optic nerve-head was swollen to about the same degree as that of the right eye. The type of the neuro-retinitis was identical with that of its fellow. There was a want of capillarity in the substance of the disc. The retinal arteries, like those of the other eye, were greatly reduced in size and the related veins were much diminished. No signs of any hemorrhages or gross inflammatory products could be found.

Vision in each eye seemed to be lost.

The eyeballs possessed free and undisturbed motion, though at times a series of nystagmic impulses of brief excursive movement seemed to be present.

On the following day, the patient had a brief attack of vomiting, which is described as projectile in character, the ejecta being forcibly emitted some distance in front of the subject.

On the morning of February 27th, it was noticed that a small quantity of blood was oozing from his left nostril. Scattered over the face and the chest there were a number of papules.

The patient still complained when spoken to, asking, "Well, what do you want?" or suddenly exclaiming, "I'm awake!"

He was so weak as to be unable to stand, at times having a marked inclination to pitch forward. A slight degree of ankle-clonus on each side had become noticeable.

At times, he complained very greatly of headache, particularly if I attempted to direct the light of the ophthalmoscopic mirror upon the retina of either eye.

Examination of the auditory apparatus by one of my colleagues, Dr. John Morley Marshall, some two weeks after my first ophthalmic examination, failed to show any evidence of aural complication.

On March 23d, the case record reads: "From day to day the knee-jerk and the ankle-clonus have been elicited, with the result that a decided difference in their intensities have been noticed during each examination, they sometimes being increased, and at other times being diminished."

The choking sensation during the act of swallowing, dependent upon faulty deglutition, continued. The patient remained stupid and listless, though the cephalalgia did not appear to be so intense.

A few days later, it was noticed that his audition, like his vision, had disappeared (a tin can vigorously pounded near his ears not producing the slightest apparent auditory impression).

The incontinence of urine and *fæces* continued. He began to grow much weaker, and his skin assumed a much more anæmic appearance.

His treatment had been most varied, embracing alteratives, stimulants, digestives, and the most carefully regulated diet.

On March 3d of the same year, he painlessly sank, became comatose, and died. The necropsy notes bore out the ante-mortem diagnosis of tumor of the cerebellum. The autopsy was made by Doctors Lloyd and Bowman.

The body was that of a tall, much emaciated male, having several bedsores situated over the sacrum. There was a tattooing mark upon the flexor surface of the left forearm.

On opening the abdominal cavity the walls were noted to be thin and muscular and of dark color. The intestines were contracted. There was the usual amount of peritoneal fluid present. The appendix vermiformis was very long, its distal end being curled upon itself. The sigmoid flexure was elongated and distended with gas.

The pleura did not show any adhesions. The diaphragm extended to the fourth interspace on both sides. The pericardium, which contained about four fluid ounces of a yellowish fluid, was apparently normal.

The right auricle was distended with a chicken-fat and currant-jelly-like clot extending into the great vessels. The mitral orifice of the organ admitted three fingers. The valves were normal. The right ventricle was distended with clotted blood. The left auricle contained some clotted blood. The left ventricle was empty. The tricuspid orifice admitted two fingers. The valves were slightly thickened, showing areas of reddening. There were not any vegetations along the margin of the valves. The arch of the aorta appeared normal. The heart muscle was pale and flabby, the wall of the left ventricle being about one and a quarter centimetres thick.

The left lung was crepitant, the lower portion of the lower lobe being congested

and slightly œdematous. The external surface of lower lobe of the right lung presented an area of five centimetres in diameter. It was dark red in color, and at its centre there was a depressed suppurating area one and a quarter centimetres deep. The lung was crepitant throughout. Beneath the suppurating area there were other similar small ones.

The spleen and both supra-renal capsules were normal.

The left kidney was large. Its capsule stripped fairly well. It was dark red in color and its cortex was slightly narrowed. There was a considerable amount of fat in its peivis. The external surface of the right kidney showed a small (white) calcareous nodule. This kidney was smaller than its fellow; otherwise it was the same.

The ureters and the bladder were normal.

The liver was slightly enlarged. It cut with slight resistance and was firm. The gall-bladder was normal.

Upon removal of the skull-cap, a very large tumor was found between the vermiform process of the cerebellum and the overlying cerebral hemisphere. On careful dissection, this growth was easily shelled out of its bed. It was found to have only the slightest connection with the brain substance. It was encapsulated. By pressure downward it had flattened and destroyed the appearance of the quadrigeminal bodies and the veins of the cerebellum, but the aqueduct of Silvius was pervious, and the anterior medullary velum was unbroken.

The tumor growth was nodular, especially on its anterior superior aspect; in which situation, one large nodule, the size of a grape, had made pressure into the left cerebral hemisphere. The growth, which was very vascular, was six centimetres wide in its greatest diameter, six and a half centimetres long in its antero-posterior diameter, and four and a half centimetres in its vertical diameter.

On section, it proved to be a sarcoma. Its most striking characteristic, next to its size, was its comparative freedom from connection with the surrounding brain substance. There was no infiltration of any of the neoplastic tissue in the neighborhood. The ventricles of the brain were much distended. There were very large pacchyonian bodies situated along the course of the longitudinal fissure, these being deeply imbedded in the vault of the cranium.

The weight of organs was: Heart, 250 grammes; left lung, 510 grammes; right lung, 780 grammes; spleen, 110 grammes; left kidney, 170 grammes; right kidney, 140 grammes; liver, 1570 grammes, and brain, 1380 grammes.